Intellectual Property and the Economic Development of the International Space Station*

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Abstract. The planning and assembly of the International Space Station (ISS) has involved complex multinational cooperation and collaboration. Establishing the roles and responsibilities of each partner has required extensive depth and breadth of fore thought, analysis and negotiation. The resulting intergovernmental agreement (IGA) and memorandum of understandings (MOUs) not only establish the requisite obligations of the partners for the technical and operational considerations, but also establishes provisions for crew conduct and the treatment and protection of intellectual property. The intellectual property provisions of these agreements reflect the partners understanding that the protection and treatment of confidential and proprietary data and inventions are critical factors for achieving optimum industry participation and successful economic development of the ISS. Unique and exciting opportunities for industrial ventures to be undertaken on-board the station are a reality. As an informational resource for private industry, we have prepared a reference guide that consolidates the network of protection provided for intellectual property transported to and developed on-board the space station. This paper conveys the guiding principles and provisions established for the treatment of intellectual property within the space station environment.

Introduction

In the Commercial Space Act of 1998[1], Congress declared that a "priority goal of constructing the International Space Station is the economic development of Earth orbital space". NASA's response to congressional declarations promoting free enterprise and U.S. economic development based on the International Space Station (ISS) can be found in NASA's Commercial Development Plan for the International Space Station[2]. In this implementation plan, NASA set forth its short-term goal to "begin the transition to private investment and offset a share of the public cost for operating the space shuttle and Space Station…." NASA's long term goal as set forth in the plan is to "establish the foundation for a marketplace and stimulate a national economy for space products and services in low-Earth orbit…."

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** Opinions expressed herein are those of the author and do not necessarily represent the policy of the National Aeronautics and Space Administration.

[1] P.L. 105-303 (October 28, 1998).

[2] Final Draft, November 16, 1998.

As Ralph Waldo Emerson said, "The future belongs to those who prepare for it." In the past year, NASA has proceeded with implementation the initiatives which were set forth in this plan and received multiple commercial offers from industry. Our primary emphasis during this time has been to establish an efficient, "business-friendly" operation for entering into agreements with industry for ISS economic development opportunities. To this end, NASA identified three obstacles to maximizing our business relationships with industry – ISS pricing, a process for receiving and evaluating entrepreneurial offers, and a clear understanding by the business sector of intellectual property protection in the ISS environment. Currently, NASA has gained legislative approval to establish a Space Station Commercial Development Demonstration Program[3], established an ISO 9001 compliant process for "Receipt and Disposition of ISS Entrepreneurial Offers"[4] and prepared a reference guide addressing the intellectual property provisions applicable to the ISS program. The purpose of this paper is to provide an overview of the system of agreements, regulations and provisions that set forth the terms and parameters for the treatment of intellectual property and how proprietary data and goods will be exchanged and protected in the ISS environment.

Innovation and Economic Development

Historically, the U.S. Government through NASA has led the nation into many great new frontiers in space and technology. One such venture is underway with the building of the International Space Station. It's a marvel of innovation, vision and international collaboration. Where we are today is only a fraction of where we will be in the years ahead. As NASA's predecessor National Advisory Committee for Aeronautics (NACA) provided the leadership in aeronautics and provided the initial investment into what we now know as the commercial airline industry, we envision a similar development of commercial enterprise in space through the establishment of the ISS.

One of the primary methods by which the ISS will create new economic value is through the creation of intellectual property and capitalization of business enterprises involved in licensing these inventions and developing new commercial products and services. The space environment provides opportunities for research and development that are unmatched anywhere else. The micro-gravity and ultra-vacuum environments of space provide unique opportunities for advancing our understanding of physical and molecular

[3] P.L. 106-74 (October 20, 1999).
[4] An entrepreneurial offer is defined as a written offer for a new or innovative idea, involving ISS assets, submitted to NASA on the initiative of the offeror for the purpose of creating value-added products or services for sale primarily to the private sector, which is not in response to a request for proposal. This is being distinguished as different from unsolicited proposals seeking a procurement contract (as defined by Federal Acquisition Regulations (FAR)).

dynamics. In an independent study[5] evaluating the potential pathfinder areas for commercial development of the ISS, the report concludes that there are commercial opportunities across the entire scope of the ISS program. Specifically, opportunities exist in using the Space Station for research and development, operation and servicing of the ISS infrastructure, and development of new capabilities to augment the ISS. Media services and sponsorships may also be near-term commercial opportunities.

Protection and ownership of intellectual property are critical to the success of most businesses, especially for those involved in research and development efforts through collaborative business relationships. Therefore, the creation, use, transfer, ownership and protection of intellectual property created as a result of the ISS program is of utmost importance. Industry's involvement in the economic development of the ISS has been part of NASA's and Congress's vision since the space station was conceived. Prior to the construction of the space station, Congress enacted legislation enabling our implementation of the requisite provisions for protection of intellectual property in the ISS environment.

With the goal of addressing industry's vested interest in this valuable asset, NASA has prepared an ISS intellectual property reference guide[6] which synopsizes and analyzes the international agreements and U.S. laws. The guide details how proprietary data and goods will be exchanged and protected on the way to, from and on the ISS. A summary of the principles that are integral elements of our international ISS agreements and establish the framework for all participation in the ISS program will be provided in the sections that follow. These will be of interest to those preparing to invest themselves and their organizations in the utilization of one of the most innovative and exciting visions of our time.

Framework for Intellectual Property Rights

The five partners which joined together for the development and utilization of the International Space Station are Canada, Europe, Japan, Russia and the United States. These partners are joined in agreement through the Inter-Governmental Agreement (IGA)[7]. In addition to the extensive provisions and procedures within this agreement, NASA has a separate Memorandum of Understanding (MOU) with each of these

[5] Commerce and the International Space Station, results of an independent study required under the Commercial Space Act of '98, commissioned by NASA, and performed by KPMG, LLC. Unpublished.
[6] Intellectual Property and the International Space Station: Creation, Use, Transfer, and Ownership and Protection, prepared by the Office of General Counsel, National Aeronautics and Space Administration, September 1999. The Executive Summary is provided as an attachment to this paper. The reference guide is available in its entirety at the web site - http://commercial.nasa.gov/.
[7] Agreement Among the Government of Canada, the Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States Concerning Cooperation on the Civil International Space Station, January 29, 1998.

partners. These MOUs contain more specific provisions, but do not conflict with the terms set forth in the IGA. In total, these agreements place a premium on proprietary or commercially sensitive information and authorize the establishment of strict procedures for protecting it.

In addition to our ISS Partners, civil service employees and Government contractors may come into contact with U.S. commercial data. As an employee of the Federal Government, a civil servant bares the responsibility for proper protection of proprietary data. Failure to take the proper level of protection may subject the employee to criminal penalty[8]. Often working closely with civil servants, Government contractors are involved to some degree in almost all design, development and operational aspects of the U. S. space program, which specifically includes the ISS and the Shuttle programs. The following section summarizes the principles under which the ISS partners have agreed to operate, as well as, the relevant provisions under which our Government contractors operate.

Limitations on Use and Disclosure of Data

One of the key factors for achieving proper treatment of proprietary or confidential data is that it be properly marked so those that come into contact with data are aware of its nature and the restrictions applied to the treatment of it. Within U.S. Government contracts, the Federal Acquisition Regulation (FAR) clause, 52.227-14, Rights in Data – General, addresses the rights to and protection of data. In general, all NASA contractors agree that to the extent they receive or are given access to data that is necessary for the performance of the contract from or by the Government or others acting on behalf of the Government, and the data contains restrictive markings, the contractor will treat the data in accordance with the markings.

Similarly, through the IGA and MOU, each Partner has agreed that they shall respect the proprietary rights in and the confidentiality of properly identified and appropriately marked data and goods. Each Partner agrees to protect the marked proprietary data in accordance with the marking. A corollary principle, however, is that third party proprietary data which may be required in order for Partners to carry out their responsibilities will be kept to a minimum. Examples which have been specifically identified in the IGA where the Partners agree to provide protection of goods and data when identified and marked as noted above include, but are not limited to, the following:

[8] 18 U.S.C. 1905 "Whoever, being an officer or employee of the United States…publishes, divulges, discloses, or makes known in any manner or to any extent not authorized by law any information coming to him in the course of his employment or official duties…which information concerns or relates to the trade secrets, processes, operations, style of work, or apparatus, or to the identity, confidential statistical data, amount or source of income, profits, losses, or expenditures of any person, firm, partnership, corporation, or association…shall be fined not more than $1,000, or imprisoned not more than one year, or both; and shall be removed from office or employment."

- Data and goods transported on its (or a Partner's) space transportation system
- Utilization data passing through communication systems of the Station.
- Third party proprietary data derived from an experiment.
- Exchange of proprietary design, manufacturing and processing data and associated software for interface, integration or safety purposes

The Partners have also agreed that ISS Crew Members shall limit the use and disclosure of any data or goods, including proprietary or export controlled data or goods, to those purposes necessary for the performance of their assigned tasks. Additionally, currently under development, is an ISS Code of Conduct[9] which will be an enforceable obligation between the respective Partners and their crew members. It will provide that information obtained by a crew member in the course of performing his or her duties that is proprietary, confidential, or otherwise not generally available shall only be used for official purposes and shall not be used to further private interest. Each Partner has the explicit responsibility to ensure that its crew members comply with a Code of Conduct that has been developed and approved in advance. The IGA further stipulates that the withdrawal by a Partner from the ISS partnership shall not affect rights or obligations regarding the protection of technical data and goods which were transferred under the Agreement.

Principles of Inventorship on the ISS

For purposes of determining the country of inventorship, a territorial approach based on the ownership/registry of elements has been established. Therefore, an inventive activity occurring on an element is deemed to have occurred in the territory of the Partner who owns/registers that element. For example, if the invention was performed in the Japanese laboratory, the patent must be filed initially in Japan; this does not impact the ownership of the invention nor does it preclude filing for a patent in multiple countries including the US.

The Space Station Crew will operate as an integrated team, which means that any crew member regardless of his or her nationality could be assigned to perform any utilization activity. Therefore, other than US astronauts could be assigned to perform US based commercial experiments. In theory, this astronaut could conceive of a patentable invention while working on the commercial experiment. In actuality, the probabilities are minimal; in the 18-year history of experiments being performed aboard the space shuttle, no astronaut has become an inventor as a result of performing these experiments. The possibility of any crew member being able to make an invention while performing a

[9] IGA, Article 11, establishes that each Partner has explicit responsibility to ensure its crew members comply with a Code of Conduct that has been developed and approved in advance. The Crew Code of Conduct is currently in draft form.

commercial experiment is greatly minimized or even eliminated by the entity flying the experiment. This can be done by fully scripting the experiment, which is currently done on the space shuttle, or by packaging the experiment as a self-contained unit.

Conclusion

"The only limit to our realization of tomorrow will be our doubts of today."[10] There is reason to have confidence in working commercially with NASA on the economic development of the ISS. NASA's history with the private sector in partnering with and performing experiments on the shuttle program and on unmanned missions has been unblemished. As the securities markets often disclaim that past performance is not necessarily a predictor of future performance, we have, in fact, taken the necessary steps to ensure that our success continues. We have been diligent about the handling and protection of intellectual property in the past and we remain cognizant of its continued importance in achieving the vision we have for the ISS. As circumstances for concern arise, we will continue to take measures to ensure intellectual property matters are resolved for utmost protection and equitable benefit of the vested parties.

Many of the resources footnoted in this paper and other relevant ISS economic development information are available on NASA's web site: http://commercial.nasa.gov/. We invite you to review this site, frequently, as we will continue to update it with news and activities of interest. We also welcome your comments as we explore new opportunities together.

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[10] Quote from Franklin Delano Roosevelt.